REMARKS

Favorable reconsideration of this application is requested in view of the above amendments and the following remarks. Applicants amend independent claims 1, 12, 18, and 30, and have not added new matter. Support in the originally filed specification for the cycle of gaps of at least 100 μm is given on page 6, lines 22-35. Claims 24-29 are withdrawn. Claims 30 and 31 are canceled. Claims 1-23 are pending.

A telephone interview took place on April 3, 2008. In the interview, Examiner Sonya D. McCall-Shepard and Attorney for Applicants, Ms. Karuna Ojanen, Reg. No. 32,484 discussed amending the independent claims to include "a cycle of the gaps is at least 100 μm." On behalf of the Applicants, the Attorney asserted that a substrate having gaps of 100 μm was not known at the time of the invention. The Examiner responded that the amendment must be presented before she would consider the patentability of the claims; the Examiner further suggested that the importance of the proposed amendments be presented and to further submit any additional materials that may provide support for the criticality of the claimed features. Applicants herein present a supplemental IDS and amended claims.

The rejection of the claims in view of Kidoguchi '586

Applicants traverse the rejection of claims 1and 2 as being anticipated by Kidoguchi '586; claims 3, 5-11, 13 and 16-23 as being obvious over Kidoguchi '586; and claim 4 as being obvious over Kidoguchi '586 in view of Koike '770.

With respect to Kidoguchi '586, the primary reference used in the rejections, Applicants disagree that Kidoguchi '586 teaches or suggests crystal growth using a melt containing a Group III element and alkali metal, as required by claims 1 and 18. The rejection of claims 1 and 18 refers to column 17, lines 53-60 of Kidoguchi '586 which specifically disclose crystal growth using metalorganic vapor phase epitaxy (MOVPE). MOVPE is a chemical vapor deposition method wherein vapors of metalorganics and the metal hydrides chemically react on a substrate to achieve crystal growth. MOVPE is not the same as a method using a melt containing a Group III element and an alkali metal,

required by claims 1 and 18, nor can MOVPE be modified easily to create the claimed method.

Regarding claim 4, Koike '770 discloses similar techniques to Kidoguchi '586 and does not correct the shortcomings of Kidoguchi '586. Claims 2-11 and 19-23, moreover, are allowable at least by virtue of their dependence upon claims 1 and 18, respectively. Applicants do not concede the correctness of the rejection. Applicants request the withdrawal of the rejection of claims 1-11, 13, 16-23 being anticipated by or obvious in view of Kidoguchi '586, Koike '770, and/or Sarayama '663, and D'Evelyn '434.

The rejection of the claims in view of Kidoguchi '586 and Sarayama '663

Applicants also traverse the rejection of claims 12 and 14 as being obvious in view of Kidoguchi '586 in view of Sarayama '663, and claim 15 as being obvious over Kidoguchi '586 in view of Sarayama '663 and D'Evelyn '434. As discussed above, Kidoguchi '586 does not teach or disclose crystal growth using a melt containing a Group III element and an alkali metal. With respect to claim 15, neither Sarayama '663 nor D'Evelyn '434 correct the shortcomings of Kidoguchi '586; both disclose techniques for the growth of a single GaN crystal, rather than forming a Group III nitride layer having a cycle of gaps of at least 100 μm.

Sarayama '663 discloses the preparation of a single GaN crystal in the presence of a melt, *see* column 5, line 45 through column 6, line 8, for the creation of a bulk GaN substrate. D'Evelyn '434 discloses the growth of a single GaN crystal using nucleation, pressurization and temperature gradients.

A feature of the claimed invention is to form a seed crystal substrate with a cycle of gaps of at least 100 μm; this was not thought to be possible given the state of knowledge at the time of the invention. Crystal growth in a lateral direction using vapor deposition techniques results in dislocation densities on the order of 10^7 and 10^8 per square centimeter. Dislocations interfere with channel mobility and fewer dislocations result in improved energy and light transmission of GaN photoactive crystals. To stop the propagation of dislocations spreading, some techniques at the time of the invention

employed striped masks to create gaps, as evidenced by Kidoguchi '586, Yoshimoto et al., Low-Temperature Microscope Photoluminescence Images of Epitaxially Laterally Overgrown GaN, Jpn. J. Appl. Phys., Vol. 40 (2001) Part 2, No. 4B, pp. L386-L388, and Bohyama, et al., Distribution of Threading Dislocations in Epitaxial Lateral Overgrowth GaN by Hydride Vapor-Phase Epitaxy Using Mixed Carrier Gas of H_2 and N_2, Jpn. J. Appl. Phys., Vol 41 (2002) Part 1, No. 1, pp. 75-76. At the time of invention, a feasible cycle of the gaps of a seed substrate was thought to be on the order of 10 μm-20 μm at the maximum.

Because none of the references, Kidoguchi '586, Sarayama '663, Koike '770, D'Evelyn '434, or the two Jpn. J. Appl. Phys. articles, teach or disclose the growth of Group III nitride crystals on a seed substrate having gaps with a cycle of at least 100 μm, Applicants request the withdrawal of the rejection and allowance of the claims.

Claims 14 and 15, moreover, are allowable at least by virtue of their dependence upon claim 1; Applicants do not concede the correctness of the rejection.

Applicants request reconsideration of the rejections and allowance of the claims. Should any questions or issues remain that can be resolved with a telephone call, the Examiner is invited to telephone Mr. Douglas P. Mueller, Reg. No. 30300, at 612.455.3804.

Respectfully submitted,

HAMRE, SCHUMANN, MUELLER & LARSON, P.C.
P.O. Box 2902
Minneapolis, MN 55402-0902
(612) 455-3800

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By: _____
Douglas P. Mueller
Reg. No. 30,300
DPM/KO/ad